

THE CHICAGO FIRE

A fire in the Chicago air route traffic control center destroyed telecommunications infrastructure, damaging essential air-to-ground communications and flight planning capability. **Tim Arel**, Chief Operating Officer of the FAA's Air Traffic Organization, explains what happened, and what was learned.

We've all learned that we should plan and drill or prepare for workplace contingencies, but as much as we try, we can't imagine every circumstance that will come our way. A key lesson for the Federal Aviation Administration (FAA) over the years has been our focus on developing the right foundations to allow us to be agile enough to rapidly respond to foreseeable events, and knowing how to pivot when an unpredictable event occurs.

We have 580 staffed air traffic control facilities and around 74,000 pieces of equipment in the US National Airspace System (NAS). And like many other ANSPs, we have planned for and experienced system and facility outages due to equipment failures and natural disasters. Our goal, of course, is to prevent disruptions in the NAS, and we have established contingency plans for these commonly recurring events and every facility has a scalable plan for dealing with them.

We routinely plan for natural disasters such as hurricanes and wildfires and we include those plans as part of our annual refresher courses. This allows us to review checklists as well as employ threat reduction and risk analysis tools. When we see the condition approaching, we establish a joint crisis action team or JCAT in our national command center. This is a small cell that can vary in size depending on the needs of the event. Typically, a JCAT will be formed with FAA representatives from key operational service units, operational support service units, and experts from our command center, dedicated to the event.

We also pre-position people, equipment and supplies in strategic areas as close to the event as possible where we can respond as soon as it's safe to do so. That includes pre-positioning our agency's aircraft along with teams of technicians and rapid 'go teams' ready to deploy. The point is that we plan and respond as an organization with all of our operational support elements coordinating in real time, led through those conversations at that JCAT.

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One large-scale event quickly escalated beyond the scope of our normal contingency plans: The Chicago center fire. In September 2014, a contract employee deliberately set fire in a critical equipment area of our Chicago air route traffic control center. The fire destroyed our telecommunications infrastructure, essential to all air traffic control voice and data communications, at a central communications equipment node in the building even though it had redundant pass on the way into the building. This took out our essential air-to-ground communications capability as well as our ability to process flight plans at one of the busiest centers in the country. We initially stopped all traffic from transiting Chicago Center's airspace but quickly transferred this high-altitude traffic responsibility to adjoining centers. These adjacent

centers did a fantastic job overcoming the limitations of their surveillance and communications capability. Several of our radar approach control facilities pitched in and provided services to aircraft at lower altitudes.

Nearly 200 of our Chicago Center controllers were dispatched after a couple of days to the surrounding facilities to provide advice and support in those areas that were now working Chicago's traffic. Air traffic controllers are certified to work specific airspace.

In this situation controllers who were not certified in Chicago airspace worked traffic alongside Chicago controllers who were certified and knew the airspace. As a result, we were able to operate near-normal levels at Chicago's O'Hare and Midway airports during the 17-day outage.



What was most impressive is the amount of work that our technical operations team (Tech Ops) had to do to reroute surveillance and communications capabilities to those surrounding facilities. As if this weren't remarkable enough, Tech Ops simultaneously restored 20 racks of equipment, 835 telecommunications circuits, and more than ten miles of cable to reroute traffic communication and data to adjacent facilities while restoring service to the damaged Chicago Center facility. Still, passengers were significantly inconvenienced, and the airlines incurred incredible cost due to delays that had to be endured until we resumed service in Chicago.

The Chicago fire and the associated insider threat got our attention and made us shift from not only a risk management and contingency planning perspective, but to focus on system resiliency as well. We have a

robust national airspace system and it could handle temporary deviations, but we learned we needed to measure and address our ability to rebound from surprise events that fall outside of design parameters. We shifted our focus to making buildings and systems more resilient with additional layers of redundancy to prevent future events.

We also learned, and we explained to our Congressional oversight committees, that we could not afford to have a spare air traffic control center standing by with extra controllers certified on every piece of airspace throughout our system. As for

addressing the human element of this contingency equation, we added enhanced security measures and additional background checks as added threat reduction measures.

Overall, we have learned to design, monitor and respond from a system perspective. Despite our best efforts, we cannot anticipate every unique situation, but by empowering our professionals to be innovative and flexible, while meeting the intent of our contingency plans, following the tenets of our safety management system in collaborating, we have matured into a more resilient organization. **S**



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